



QAL1 Report

Description of evaluated measurement procedure

Automated Measuring System (AMS) based on
Analyzer module serial number (optional)
Quotation or order number
Intended for monitoring of
Applicable EU directive
Name of plant
Gas to be measured
Smallest range of AMS
Largest range of AMS (optional)

ACF-NT CO2	
S/N 32529005 - 32529015	
Waste incineration plant	
2000/76/EC	
Tossilo - Macomer	
CO2	
30	Vol. %
	Vol. %

Test value and required quality at that value

Test concentration (Emission Limit Value, ELV)

Required measurement quality as 95% confidence interval
Shortest averaging time of measured values
Required response time

30	Vol. %
20	% of ELV
30	minutes
25	% of shortest averaging time

Field conditions of operation used in the uncertainty assessment

Ambient temperature range
Ambient pressure range
Flow range
Voltage range

Min. value	Max. value	
25	25	°C
1010	1015	hPa
200	200	l/h
190	250	V

Internal diameter of sample gas line
Length of sample gas line
Average flow of sample gas

6	mm
20	m
200	l/h

Time between (automatic) span calibration

180	days
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Ranges of chemical interferences for

Combustion process

Component

O2
H2O
CO
CO2
CH4
N2O
NO
NO2
NH3
HCl
SO2

Min. value	Max. value	
3	9	Vol. %
1	12,6	Vol. %
0	20	mg/m ³
0	8,7	Vol. %
0	0	mg/m ³
0	2	mg/m ³
0	20	mg/m ³
0	2	mg/m ³
0	5	mg/m ³
0	4	mg/m ³
0	10	mg/m ³



QAL1 Report

(continued)

Contributing partial standard uncertainties and reference to their origins

Selectivity H ₂ O	0,13	Vol. %
Selectivity others (largest sum)	0,00	Vol. %
Lack of fit	0,06	Vol. %
Drift	0,03	Vol. %
Pressure dependence	0,00	Vol. %
Temperature dependence	0,00	Vol. %
Flow dependence	0,00	Vol. %
Voltage dependence	0,00	Vol. %
Repeatability	0,00	Vol. %
Uncertainty of response factors	0,00	Vol. %
Uncertainty of converter efficiency (SCC-K NO _x converter)	0,00	Vol. %
Response time	130	seconds
Origin of data	Report of TÜV suitability test, 03/1995 (Gerät 2)	
Long-term drift of calibration cell	0,00	Vol. %
Origin of data	Not applicable	
Uncertainty of SRM	0,19	Vol. %
Standard Reference Method (SRM), Reference	NDIR, ISO 12039	
Uncertainty of cylinder gas	0,30	Vol. %
Origin of data	Datasheet of gas supplier	

Determination and assessment of expanded uncertainty

Expanded uncertainty	0,75	Vol. %
Required measurement quality as 95% confidence interval	6,00	Vol. %
Confidence interval met	YES	
Total response time	140	seconds
Required response time	450	seconds
Response time met	YES	
Conclusion	The AMS is ACCEPTABLE	

This report confirms that the product
ACF-NT CO₂
operating with system components as described in §3 of the TÜV suitability test report
complies with the requirements of EN 14181:2004 QAL1
according to the International Standard ISO 14956:2002
for the above specified operating conditions.



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Description of evaluated measurement procedure

Automated Measuring System (AMS) based on
Analyzer module serial number (optional)
Quotation or order number
Intended for monitoring of
Applicable EU directive
Name of plant
Gas to be measured
Smallest range of AMS
Largest range of AMS (optional)
Smallest certified range for AMS

ACF-NT CO

S/N 32529005 - 32529015

Waste incineration plant

2000/76/EC

Tossilo - Macomer

CO

75

mg/m³

300

mg/m³

75,00

mg/m³

Test value and required quality at that value

Test concentration (Emission Limit Value, ELV)

20

mg/m³

Limiting value according directive or standard

Required measurement quality as 95% confidence interval

2001/80/EC and 2000/76/EC

10

% of ELV

Shortest averaging time of measured values

Required response time

30

minutes

25

% of shortest averaging time

Field conditions of operation used in the uncertainty assessment

Ambient temperature range

Ambient pressure range

Flow range

Voltage range

Accuracy of test gas according TÜV report

Internal diameter of sample gas line

Length of sample gas line

Average flow of sample gas

Time between (automatic) span calibration

Ranges of chemical interferents for

Min. value Max. value

25

25

°C

1010

1015

hPa

200

200

l/h

190

250

V

3,64 %

6

mm

20

m

200

l/h

60

days

Combustion process

Component

O₂

H₂O

CO

CO₂

CH₄

N₂O

NO

NO₂

NH₃

HCl

SO₂

Min. value Max. value

3

9

Vol. %

9

12,6

Vol. %

0

20

mg/m³

0

8,7

Vol. %

0

0

mg/m³

0

2

mg/m³

0

20

mg/m³

0

30

mg/m³

0

5

mg/m³

0

4

mg/m³

0

10

mg/m³



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(continued)

Contributing partial standard uncertainties and reference to their origins

Selectivity H ₂ O	0,00	mg/m ³
Selectivity others (largest sum)	0,70	mg/m ³
Lack of fit	0,24	mg/m ³
Drift	-0,27	mg/m ³
Pressure dependence	0,00	mg/m ³
Temperature dependence	0,00	mg/m ³
Flow dependence	0,00	mg/m ³
Voltage dependence	0,09	mg/m ³
Repeatability	0,90	mg/m ³
Uncertainty of response factors	0,00	mg/m ³
Uncertainty of converter efficiency (SCC-K NO _x converter)	0,00	mg/m ³
Response time	136	seconds
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	
Long-term drift of calibration cell	0,00	mg/m ³
Origin of data	not applicable	
Uncertainty of cylinder gas	0,22	mg/m ³
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	

Determination and assessment of expanded uncertainty

	2001/80/EC and 2000/76/EC	
Expanded uncertainty	1,99	mg/m ³
Required measurement quality as 95% confidence interval	2,00	mg/m ³
Confidence interval met	YES	
	EN14181	
Total response time	146	seconds
Required response time	450	seconds
Response time met	YES	
Conclusion	The AMS is ACCEPTABLE	

This report confirms that the product
ACF-NT CO
operating with system components as described of the TÜV suitability test report
complies with the requirements of EN 14181:2004 QAL1
according to the International Standard ISO 14956:2003
for the above specified operating conditions.



QAL1 Report

Description of evaluated measurement procedure

Automated Measuring System (AMS) based on
Analyzer module serial number (optional)
Quotation or order number
Intended for monitoring of
Applicable EU directive
Name of plant
Gas to be measured
Smallest range of AMS
Largest range of AMS (optional)
Smallest certified range for AMS

ACF-NT HCl		
S/N 32529005 - 32529015		
Waste incineration plant		
2000/76/EC		
Tossilo - Macomer		
HCl		
15	mg/m ³	
120	mg/m ³	
15,00	mg/m ³	

Test value and required quality at that value

Test concentration (Emission Limit Value, ELV)

4	mg/m ³
2001/80/EC and 2000/76/EC	
40	% of ELV
30	minutes
25	% of shortest averaging time

Limiting value according directive or standard

Required measurement quality as 95% confidence interval

Shortest averaging time of measured values

Required response time

Field conditions of operation used in the uncertainty assessment

	Min. value	Max. value	
Ambient temperature range	25	25	°C
Ambient pressure range	1010	1015	hPa
Flow range	200	200	l/h
Voltage range	190	250	V
Accuracy of test gas according TÜV report		3,64	%
Internal diameter of sample gas line	6	mm	
Length of sample gas line	20	m	
Average flow of sample gas	200	l/h	
Time between (automatic) span calibration	180	days	
Ranges of chemical interferents for	Combustion process		
Component	Min. value	Max. value	
O ₂	3	9	Vol. %
H ₂ O	9	12,6	Vol. %
CO	0	20	mg/m ³
CO ₂	0	8,7	Vol. %
CH ₄	0	0	mg/m ³
N ₂ O	0	2	mg/m ³
NO	0	20	mg/m ³
NO ₂	0	30	mg/m ³
NH ₃	0	5	mg/m ³
HCl	0	4	mg/m ³
SO ₂	0	10	mg/m ³



QAL1 Report

(continued)

Contributing partial standard uncertainties and reference to their origins

Selectivity H ₂ O	0,07	mg/m ³
Selectivity others (largest sum)	0,13	mg/m ³
Lack of fit	-0,05	mg/m ³
Drift	-0,16	mg/m ³
Pressure dependence	0,00	mg/m ³
Temperature dependence	0,00	mg/m ³
Flow dependence	0,00	mg/m ³
Voltage dependence	-0,03	mg/m ³
Repeatability	0,28	mg/m ³
Uncertainty of response factors	0,00	mg/m ³
Uncertainty of converter efficiency (SCC-K NO _x converter)	0,00	mg/m ³
Response time	144	seconds
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	
Long-term drift of calibration cell	0,00	mg/m ³
Origin of data	not applicable	
Uncertainty of cylinder gas	0,08	mg/m ³
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	

Determination and assessment of expanded uncertainty

	2001/80/EC and 2000/76/EC	
Expanded uncertainty	0,61	mg/m ³
Required measurement quality as 95% confidence interval	1,60	mg/m ³
Confidence interval met	YES	
	EN14181	
Total response time	154	seconds
Required response time	450	seconds
Response time met	YES	
Conclusion	The AMS is ACCEPTABLE	

This report confirms that the product
ACF-NT HCI
operating with system components as described of the TÜV suitability test report
complies with the requirements of EN 14181:2004 QAL1
according to the International Standard ISO 14956:2003
for the above specified operating conditions.



QAL1 Report

Description of evaluated measurement procedure

Automated Measuring System (AMS) based on
Analyzer module serial number (optional)
Quotation or order number
Intended for monitoring of
Applicable EU directive
Name of plant
Gas to be measured
Smallest range of AMS
Largest range of AMS (optional)
Smallest certified range for AMS

ACF-NT HF		
S/N 32529005 - 32529015		
Waste incineration plant		
2000/76/EC		
Tossilo - Macomer		
HF		
5	mg/m ³	
8	mg/m ³	
5,00	mg/m ³	(Lab tested)

Test value and required quality at that value

Test concentration (Emission Limit Value, ELV)

0,5	mg/m ³
2001/80/EC and 2000/76/EC	
40	% ov ELV
30	minutes
25	% of shortest averaging time

Limiting value according directive or standard

Required measurement quality as 95% confidence interval

Shortest averaging time of measured values

Required response time

Field conditions of operation used in the uncertainty assessment

	Min. value	Max. value	
Ambient temperature range	25	25	°C
Ambient pressure range	1010	1015	hPa
Flow range	200	200	l/h
Voltage range	190	250	V
Accuracy of test gas according TÜV report		6,06	%
Internal diameter of sample gas line	6	mm	
Length of sample gas line	20	m	
Average flow of sample gas	200	l/h	
Time between (automatic) span calibration	90	days	
Ranges of chemical interferents for	Combustion process		
Component	Min. value	Max. value	
O2	3	9	Vol. %
H2O	9	12,6	Vol. %
CO	0	20	mg/m ³
CO2	0	8,7	Vol. %
CH4	0	0	mg/m ³
N2O	0	2	mg/m ³
NO	0	20	mg/m ³
NO2	0	2	mg/m ³
NH3	0	5	mg/m ³
HCl	0	4	mg/m ³
SO2	0	10	mg/m ³



QAL1 Report

(continued)

Contributing partial standard uncertainties and reference to their origins

Selectivity H ₂ O	0,03	mg/m ³
Selectivity others (largest sum)	0,05	mg/m ³
Lack of fit	-0,02	mg/m ³
Drift	0,05	mg/m ³
Pressure dependence	0,00	mg/m ³
Temperature dependence	0,00	mg/m ³
Flow dependence	0,00	mg/m ³
Voltage dependence	-0,01	mg/m ³
Repeatability	0,09	mg/m ³
Uncertainty of response factors	0,00	mg/m ³
Uncertainty of converter efficiency (SCC-K NO _x converter)	0,00	mg/m ³
Response time	256	seconds
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	
Long-term drift of calibration cell	0,00	mg/m ³
Origin of data	not applicable	
Uncertainty of cylinder gas	0,02	mg/m ³
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	

Determination and assessment of expanded uncertainty

	2001/80/EC and 2000/76/EC	
Expanded uncertainty	0,20	mg/m ³
Required measurement quality as 95% confidence interval	0,20	mg/m ³
Confidence interval met	YES	
	EN14181	
Total response time	266	seconds
Required response time	450	seconds
Response time met	YES	
Conclusion	The AMS is ACCEPTABLE	

This report confirms that the product
ACF-NT HF
operating with system components as described of the TÜV suitability test report
complies with the requirements of EN 14181:2004 QAL1
according to the International Standard ISO 14956:2003
for the above specified operating conditions.



QAL1 Report

Description of evaluated measurement procedure

Automated Measuring System (AMS) based on
Analyzer module serial number (optional)
Quotation or order number
Intended for monitoring of
Applicable EU directive
Name of plant
Gas to be measured
Smallest range of AMS
Largest range of AMS (optional)
Smallest certified range for AMS

ACF-NT TOC

S/N 32529005 - 32529015

Waste incineration plant

2000/76/EC

Tossilo - Macomer

TOC

15 mg/m³

60 mg/m³

15,00 mg/m³

Test value and required quality at that value

Test concentration (Emission Limit Value, ELV)

4,0 mg/m³

Limiting value according directive or standard

2001/80/EC and 2000/76/EC

Required measurement quality as 95% confidence interval

30 % ov ELV

Shortest averaging time of measured values

30 minutes

Required response time

25 % of shortest averaging time

Field conditions of operation used in the uncertainty assessment

Ambient temperature range

Min. value Max. value

25 25 °C

Ambient pressure range

1010 1015 hPa

Flow range

200 200 l/h

Voltage range

190 250 V

Accuracy of test gas according TÜV report

2,94 %

Internal diameter of sample gas line

6 mm

Length of sample gas line

20 m

Average flow of sample gas

200 l/h

Time between (automatic) span calibration

14 days

Ranges of chemical interferents for

Combustion process

Component

Min. value Max. value

O₂

3 9 Vol. %

H₂O

9 12,6 Vol. %

CO

0 20 mg/m³

CO₂

0 8,7 Vol. %

CH₄

0 0 mg/m³

N₂O

0 2 mg/m³

NO

0 20 mg/m³

NO₂

0 2 mg/m³

NH₃

0 5 mg/m³

HCl

0 4 mg/m³

SO₂

0 10 mg/m³



QAL1 Report (continued)

Contributing partial standard uncertainties and reference to their origins

Selectivity H ₂ O	0,01	mg/m ³
Selectivity others (largest sum)	0,05	mg/m ³
Lack of fit	0,00	mg/m ³
Drift	0,08	mg/m ³
Pressure dependence	0,02	mg/m ³
Temperature dependence	0,00	mg/m ³
Flow dependence	0,00	mg/m ³
Voltage dependence	0,00	mg/m ³
Repeatability	0,15	mg/m ³
Uncertainty of response factors	0,32	mg/m ³
Uncertainty of converter efficiency (SCC-K NO _x converter)	0,00	mg/m ³
Response time	33	seconds
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	
Long-term drift of calibration cell	0,00	mg/m ³
Origin of data	TÜV report no.: 821029 (06/2006)	
Uncertainty of cylinder gas	0,07	mg/m ³
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	

Determination and assessment of expanded uncertainty

	2001/80/EC and 2000/76/EC	
Expanded uncertainty	0,72	mg/m ³
Required measurement quality as 95% confidence interval	1,20	mg/m ³
Confidence interval met	YES	
	EN14181	
Total response time	43	seconds
Required response time	450	seconds
Response time met	YES	
Conclusion	The AMS is ACCEPTABLE	

This report confirms that the product
ACF-NT TOC
operating with system components as described of the TÜV suitability test report
complies with the requirements of EN 14181:2004 QAL1
according to the International Standard ISO 14956:2003
for the above specified operating conditions.



QAL1 Report

Description of evaluated measurement procedure

Automated Measuring System (AMS) based on
Analyzer module serial number (optional)
Quotation or order number
Intended for monitoring of
Applicable EU directive
Name of plant
Gas to be measured
Smallest range of AMS
Largest range of AMS (optional)
Smallest certified range for AMS

ACF-NT H2O		
S/N 32529005 - 32529015		
Waste incineration plant		
2000/76/EC		
Tossilo - Macomer		
H2O		
40	Vol. %	
	Vol. %	
40,00	Vol. %	

Test value and required quality at that value

Test concentration (Emission Limit Value, ELV)

40,0	Vol. %
2001/80/EC and 2000/76/EC	
10	% of ELV
30	minutes
25	% of shortest averaging time

Limiting value according directive or standard

Required measurement quality as 95% confidence interval

Shortest averaging time of measured values

Required response time

Field conditions of operation used in the uncertainty assessment

	Min. value	Max. value	
Ambient temperature range	25	25	°C
Ambient pressure range	1010	1015	hPa
Flow range	200	200	l/h
Voltage range	190	250	V
Accuracy of test gas according TÜV report		2,42	%
Internal diameter of sample gas line	6		mm
Length of sample gas line	20		m
Average flow of sample gas	200		l/h
Time between (automatic) span calibration	180		days
Ranges of chemical interferents for	Combustion process		
Component	Min. value	Max. value	
O2	3	9	Vol. %
H2O	9	12,6	Vol. %
CO	0	20	mg/m ³
CO2	0	8,7	Vol. %
CH4	0	0	mg/m ³
N2O	0	2	mg/m ³
NO	0	20	mg/m ³
NO2	0	2	mg/m ³
NH3	0	5	mg/m ³
HCl	0	4	mg/m ³
SO2	0	10	mg/m ³



QAL1 Report

(continued)

Contributing partial standard uncertainties and reference to their origins

Selectivity H2O	0,00	Vol. %
Selectivity others (largest sum)	0,00	Vol. %
Lack of fit	-0,36	Vol. %
Drift	-0,59	Vol. %
Pressure dependence	0,00	Vol. %
Temperature dependence	0,00	Vol. %
Flow dependence	0,00	Vol. %
Voltage dependence	0,20	Vol. %
Repeatability	0,28	Vol. %
Uncertainty of response factors	0,00	Vol. %
Uncertainty of converter efficiency (SCC-K NOx converter)	0,00	Vol. %
Response time	144	seconds
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	
Long-term drift of calibration cell	0,00	Vol. %
Origin of data	not applicable	
Uncertainty of cylinder gas	0,56	Vol. %
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	

Determination and assessment of expanded uncertainty

	2001/80/EC and 2000/76/EC	
Expanded uncertainty	1,17	Vol. %
Required measurement quality as 95% confidence interval	4,00	Vol. %
Confidence interval met	YES	
	EN14181	
Total response time	154	seconds
Required response time	450	seconds
Response time met	YES	
Conclusion	The AMS is ACCEPTABLE	

This report confirms that the product
ACF-NT H2O
operating with system components as described of the TÜV suitability test report
complies with the requirements of EN 14181:2004 QAL1
according to the International Standard ISO 14956:2003
for the above specified operating conditions.



QAL1 Report

Description of evaluated measurement procedure

Automated Measuring System (AMS) based on
Analyzer module serial number (optional)
Quotation or order number
Intended for monitoring of
Applicable EU directive
Name of plant
Gas to be measured
Smallest range of AMS
Largest range of AMS (optional)
Smallest certified range for AMS

ACF-NT NH3		
S/N 32529005 - 32529015		
Waste incineration plant		
2000/76/EC		
Tossilo - Macomer		
NH3		
15	mg/m ³	
90	mg/m ³	
15,00	mg/m ³	

Test value and required quality at that value

Test concentration (Emission Limit Value, ELV)

5,0	mg/m ³
2001/80/EC and 2000/76/EC	
40	% ov ELV
30	minutes
25	% of shortest averaging time

Limiting value according directive or standard

Required measurement quality as 95% confidence interval

Shortest averaging time of measured values

Required response time

Field conditions of operation used in the uncertainty assessment

	Min. value	Max. value	
Ambient temperature range	25	25	°C
Ambient pressure range	1010	1015	hPa
Flow range	200	200	l/h
Voltage range	190	250	V
Accuracy of test gas according TÜV report		3,64	%
Internal diameter of sample gas line	6		mm
Length of sample gas line	20		m
Average flow of sample gas	200		l/h
Time between (automatic) span calibration	180		days
Ranges of chemical interferents for	Combustion process		
Component	Min. value	Max. value	
O2	3	9	Vol. %
H2O	9	12,6	Vol. %
CO	0	20	mg/m ³
CO2	0	8,7	Vol. %
CH4	0	0	mg/m ³
N2O	0	2	mg/m ³
NO	0	20	mg/m ³
NO2	0	2	mg/m ³
NH3	0	5	mg/m ³
HCl	0	4	mg/m ³
SO2	0	10	mg/m ³



QAL1 Report

(continued)

Contributing partial standard uncertainties and reference to their origins

Selectivity H ₂ O	0,06	mg/m ³
Selectivity others (largest sum)	0,19	mg/m ³
Lack of fit	0,09	mg/m ³
Drift	0,22	mg/m ³
Pressure dependence	0,00	mg/m ³
Temperature dependence	0,00	mg/m ³
Flow dependence	0,00	mg/m ³
Voltage dependence	-0,04	mg/m ³
Repeatability	0,13	mg/m ³
Uncertainty of response factors	0,00	mg/m ³
Uncertainty of converter efficiency (SCC-K NO _x converter)	0,00	mg/m ³
Response time	143	seconds
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	
Long-term drift of calibration cell	0,00	mg/m ³
Origin of data	not applicable	
Uncertainty of cylinder gas	0,11	mg/m ³
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	

Determination and assessment of expanded uncertainty

	2001/80/EC and 2000/76/EC	
Expanded uncertainty	0,45	mg/m ³
Required measurement quality as 95% confidence interval	2,00	mg/m ³
Confidence interval met	YES	
	EN14181	
Total response time	153	seconds
Required response time	450	seconds
Response time met	YES	
Conclusion	The AMS is ACCEPTABLE	

This report confirms that the product
ACF-NT NH₃
operating with system components as described of the TÜV suitability test report
complies with the requirements of EN 14181:2004 QAL1
according to the International Standard ISO 14956:2003
for the above specified operating conditions.



QAL1 Report

Description of evaluated measurement procedure

Automated Measuring System (AMS) based on
Analyzer module serial number (optional)
Quotation or order number
Intended for monitoring of
Applicable EU directive
Name of plant
Gas to be measured
Smallest range of AMS
Largest range of AMS (optional)
Smallest certified range for AMS

ACF-NT NO		
S/N 32529005 - 32529015		
Waste incineration plant		
2000/76/EC		
Tossilo - Macomer		
NO		
200	mg/m ³	
500	mg/m ³	
200,00	mg/m ³	

Test value and required quality at that value

Test concentration (Emission Limit Value, ELV)
Equivalent NO₂ concentration
Limiting value according directive or standard
Required measurement quality as 95% confidence interval

32,6	mg/m ³
50	mg/m ³
2001/80/EC and 2000/76/EC	
20	% ov ELV
30	minutes
25	% of shortest averaging time

Shortest averaging time of measured values
Required response time

Field conditions of operation used in the uncertainty assessment

	Min. value	Max. value	
Ambient temperature range	25	25	°C
Ambient pressure range	1010	1015	hPa
Flow range	200	200	l/h
Voltage range	190	250	V
Accuracy of test gas according TÜV report		3,70	%
Internal diameter of sample gas line	6	mm	
Length of sample gas line	20	m	
Average flow of sample gas	200	l/h	
Time between (automatic) span calibration	180	days	
Ranges of chemical interferents for	Combustion process		
Component	Min. value	Max. value	
O ₂	3	9	Vol. %
H ₂ O	9	12,6	Vol. %
CO	0	20	mg/m ³
CO ₂	0	8,7	Vol. %
CH ₄	0	0	mg/m ³
N ₂ O	0	2	mg/m ³
NO	0	20	mg/m ³
NO ₂	0	2	mg/m ³
NH ₃	0	5	mg/m ³
HCl	0	4	mg/m ³
SO ₂	0	10	mg/m ³



QAL1 Report

(continued)

Contributing partial standard uncertainties and reference to their origins

Selectivity H ₂ O	1,38	mg/m ³
Selectivity others (largest sum)	1,30	mg/m ³
Lack of fit	-0,20	mg/m ³
Drift	0,78	mg/m ³
Pressure dependence	0,00	mg/m ³
Temperature dependence	0,00	mg/m ³
Flow dependence	0,00	mg/m ³
Voltage dependence	0,15	mg/m ³
Repeatability	1,37	mg/m ³
Uncertainty of response factors	0,00	mg/m ³
Uncertainty of converter efficiency (SCC-K NO _x converter)	0,00	mg/m ³
Response time	147	seconds
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	
Long-term drift of calibration cell	0,00	mg/m ³
Origin of data	not applicable	
Uncertainty of cylinder gas	0,70	mg/m ³
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	

Determination and assessment of expanded uncertainty

	2001/80/EC and 2000/76/EC	
Expanded uncertainty	3,64	mg/m ³
Required measurement quality as 95% confidence interval	6,52	mg/m ³
Confidence interval met	YES	
	EN14181	
Total response time	157	seconds
Required response time	450	seconds
Response time met	YES	
Conclusion	The AMS is ACCEPTABLE	

This report confirms that the product
ACF-NT NO
operating with system components as described of the TÜV suitability test report
complies with the requirements of EN 14181:2004 QAL1
according to the International Standard ISO 14956:2003
for the above specified operating conditions.



QAL1 Report

Description of evaluated measurement procedure

Automated Measuring System (AMS) based on
Analyzer module serial number (optional)
Quotation or order number
Intended for monitoring of
Applicable EU directive
Name of plant
Gas to be measured
Smallest range of AMS
Largest range of AMS (optional)
Smallest certified range for AMS

ACF-NT NO2		
S/N 32529005 - 32529015		
Waste incineration plant		
2000/76/EC		
Tossilo - Macomer		
NO2		
40	mg/m ³	
	mg/m ³	
40,00	mg/m ³	

Test value and required quality at that value

Test concentration (Emission Limit Value, ELV)

50,0	mg/m ³
2001/80/EC and 2000/76/EC	
20	% ov ELV
30	minutes
25	% of shortest averaging time

Limiting value according directive or standard

Required measurement quality as 95% confidence interval

Shortest averaging time of measured values

Required response time

Field conditions of operation used in the uncertainty assessment

	Min. value	Max. value	
Ambient temperature range	25	25	°C
Ambient pressure range	1010	1015	hPa
Flow range	200	200	l/h
Voltage range	190	250	V
Accuracy of test gas according TÜV report		<1	%
Internal diameter of sample gas line	6	mm	
Length of sample gas line	20	m	
Average flow of sample gas	200	l/h	
Time between (automatic) span calibration	180	days	
Ranges of chemical interferents for	Combustion process		
Component	Min. value	Max. value	
O2	3	9	Vol. %
H2O	9	12,6	Vol. %
CO	0	20	mg/m ³
CO2	0	8,7	Vol. %
CH4	0	0	mg/m ³
N2O	0	2	mg/m ³
NO	0	20	mg/m ³
NO2	0	2	mg/m ³
NH3	0	5	mg/m ³
HCl	0	4	mg/m ³
SO2	0	10	mg/m ³



QAL1 Report

(continued)

Contributing partial standard uncertainties and reference to their origins

Selectivity H ₂ O	0,59	mg/m ³
Selectivity others (largest sum)	0,00	mg/m ³
Lack of fit	0,57	mg/m ³
Drift	1,15	mg/m ³
Pressure dependence	0,00	mg/m ³
Temperature dependence	0,00	mg/m ³
Flow dependence	0,00	mg/m ³
Voltage dependence	0,00	mg/m ³
Repeatability	0,10	mg/m ³
Uncertainty of response factors	0,00	mg/m ³
Uncertainty of converter efficiency (SCC-K NO _x converter)	0,00	mg/m ³
Response time	150	seconds
Origin of data	Datasheet ACF-NT	
Long-term drift of calibration cell	0,00	mg/m ³
Origin of data	TÜV report no.: 821029 (06/2006)	
Uncertainty of cylinder gas	0,50	mg/m ³
Origin of data	Datasheet ACF-NT	

Determination and assessment of expanded uncertainty

	2001/80/EC and 2000/76/EC	
Expanded uncertainty	2,94	mg/m ³
Required measurement quality as 95% confidence interval	10,00	mg/m ³
Confidence interval met	YES	
	EN14181	
Total response time	160	seconds
Required response time	450	seconds
Response time met	YES	
Conclusion	The AMS is ACCEPTABLE	

This report confirms that the product
ACF-NT NO2

complies with the requirements of EN 14181:2004 QAL1
according to the International Standard ISO 14956:2003
for the above specified operating conditions.



QAL1 Report

Description of evaluated measurement procedure

Automated Measuring System (AMS) based on
Analyzer module serial number (optional)
Quotation or order number
Intended for monitoring of
Applicable EU directive
Name of plant
Gas to be measured
Smallest range of AMS
Largest range of AMS (optional)
Smallest certified range for AMS

ACF-NT O2		
S/N 32529005 - 32529015		
Waste incineration plant		
2000/76/EC		
Tossilo - Macomer		
O2		
25	Vol. %	
	Vol. %	
25,00	Vol. %	

Test value and required quality at that value

Test concentration (Emission Limit Value, ELV)

25,0	Vol. %
2001/80/EC and 2000/76/EC	
10	% of ELV
30	minutes
25	% of shortest averaging time

Limiting value according directive or standard

Required measurement quality as 95% confidence interval

Shortest averaging time of measured values

Required response time

Field conditions of operation used in the uncertainty assessment

	Min. value	Max. value	
Ambient temperature range	25	25	°C
Ambient pressure range	1010	1015	hPa
Flow range	200	200	l/h
Voltage range	190	250	V
Accuracy of test gas according TÜV report		2,42	%
Internal diameter of sample gas line	6		mm
Length of sample gas line	20		m
Average flow of sample gas	200		l/h
Time between (automatic) span calibration	30		days
Ranges of chemical interferents for	Combustion process		
Component	Min. value	Max. value	
O2	3	9	Vol. %
H2O	9	12,6	Vol. %
CO	0	20	mg/m ³
CO2	0	8,7	Vol. %
CH4	0	0	mg/m ³
N2O	0	2	mg/m ³
NO	0	20	mg/m ³
NO2	0	2	mg/m ³
NH3	0	5	mg/m ³
HCl	0	4	mg/m ³
SO2	0	10	mg/m ³



QAL1 Report (continued)

Contributing partial standard uncertainties and reference to their origins

Selectivity H ₂ O	0,00	Vol. %
Selectivity others (largest sum)	0,04	Vol. %
Lack of fit	-0,10	Vol. %
Drift	0,19	Vol. %
Pressure dependence	0,00	Vol. %
Temperature dependence	0,00	Vol. %
Flow dependence	0,00	Vol. %
Voltage dependence	0,00	Vol. %
Repeatability	0,06	Vol. %
Uncertainty of response factors	0,00	Vol. %
Uncertainty of converter efficiency (SCC-K NO _x converter)	0,00	Vol. %
Response time	13	seconds
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	
Long-term drift of calibration cell	0,00	Vol. %
Origin of data	not applicable	
Uncertainty of cylinder gas	0,35	Vol. %
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	

Determination and assessment of expanded uncertainty

	2001/80/EC and 2000/76/EC	
Expanded uncertainty	0,48	Vol. %
Required measurement quality as 95% confidence interval	2,50	Vol. %
Confidence interval met	YES	
	EN14181	
Total response time	23	seconds
Required response time	450	seconds
Response time met	YES	
Conclusion	The AMS is ACCEPTABLE	

This report confirms that the product
ACF-NT O2
operating with system components as described of the TÜV suitability test report
complies with the requirements of EN 14181:2004 QAL1
according to the International Standard ISO 14956:2003
for the above specified operating conditions.



QAL1 Report

Description of evaluated measurement procedure

Automated Measuring System (AMS) based on
Analyzer module serial number (optional)
Quotation or order number
Intended for monitoring of
Applicable EU directive
Name of plant
Gas to be measured
Smallest range of AMS
Largest range of AMS (optional)
Smallest certified range for AMS

ACF-NT SO2		
S/N 32529005 - 32529015		
Waste incineration plant		
2000/76/EC		
Tossilo - Macomer		
SO2		
75	mg/m ³	
400	mg/m ³	
75,00	mg/m ³	

Test value and required quality at that value

Test concentration (Emission Limit Value, ELV)

25,0	mg/m ³
2001/80/EC and 2000/76/EC	
20	% ov ELV
30	minutes
25	% of shortest averaging time

Limiting value according directive or standard

Required measurement quality as 95% confidence interval

Shortest averaging time of measured values

Required response time

Field conditions of operation used in the uncertainty assessment

	Min. value	Max. value	
Ambient temperature range	25	25	°C
Ambient pressure range	1010	1015	hPa
Flow range	200	200	l/h
Voltage range	190	250	V
Accuracy of test gas according TÜV report		3,64	%
Internal diameter of sample gas line	6		mm
Length of sample gas line	20		m
Average flow of sample gas	200		l/h
Time between (automatic) span calibration	180		days
Ranges of chemical interferents for	Combustion process		
Component	Min. value	Max. value	
O2	3	9	Vol. %
H2O	9	12,6	Vol. %
CO	0	20	mg/m ³
CO2	0	8,7	Vol. %
CH4	0	0	mg/m ³
N2O	0	2	mg/m ³
NO	0	20	mg/m ³
NO2	0	2	mg/m ³
NH3	0	5	mg/m ³
HCl	0	4	mg/m ³
SO2	0	10	mg/m ³



QAL1 Report

(continued)

Contributing partial standard uncertainties and reference to their origins

Selectivity H ₂ O	0,99	mg/m ³
Selectivity others (largest sum)	0,84	mg/m ³
Lack of fit	-0,23	mg/m ³
Drift	-0,70	mg/m ³
Pressure dependence	0,00	mg/m ³
Temperature dependence	0,00	mg/m ³
Flow dependence	0,00	mg/m ³
Voltage dependence	0,04	mg/m ³
Repeatability	1,22	mg/m ³
Uncertainty of response factors	0,00	mg/m ³
Uncertainty of converter efficiency (SCC-K NO _x converter)	0,00	mg/m ³
Response time	144	seconds
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	
Long-term drift of calibration cell	0,00	mg/m ³
Origin of data	not applicable	
Uncertainty of cylinder gas	0,53	mg/m ³
Origin of data	TÜV report, no.: 931/2120471/A (2009-2)	

Determination and assessment of expanded uncertainty

	2001/80/EC and 2000/76/EC	
Expanded uncertainty	2,99	mg/m ³
Required measurement quality as 95% confidence interval	5,00	mg/m ³
Confidence interval met	YES	
	EN14181	
Total response time	154	seconds
Required response time	450	seconds
Response time met	YES	
Conclusion	The AMS is ACCEPTABLE	

This report confirms that the product
ACF-NT SO₂
operating with system components as described of the TÜV suitability test report
complies with the requirements of EN 14181:2004 QAL1
according to the International Standard ISO 14956:2003
for the above specified operating conditions.

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

Advance CEMAS FTIR – NT (ACF-NT)
Multigas Continuous Emission Monitoring System

manufactured by:

ABB Automation GmbH
Stierstaedter Strasse 5
D-60488 Frankfurt-am-Main
Germany

has been assessed by Sira Certification Service
and for the conditions stated on this certificate complies with:

**MCERTS Performance Standards for Continuous Emission
Monitoring Systems, Version 3.4 dated July 2012,
EN15267-1:2009, EN15267-2:2009, EN15267-3:2007,
& QAL 1 as defined in EN 14181: 2004**

Certification Ranges :

CO	-	0 to 75 mg/m ³	0 to 300 mg/m ³	
NO	-	0 to 200 mg/m ³	0 to 400 mg/m ³	
SO ₂	-	0 to 75 mg/m ³	0 to 300 mg/m ³	
HCl	-	0 to 15 mg/m ³		
NH ₃	-	0 to 15 mg/m ³		
H ₂ O	-	0 to 40 %Vol		
HF	-	0 to 5 mg/m ³	0 to 10 mg/m ³	
O ₂	-	0 to 25 %Vol	0 to 12 %Vol	0 to 6 %Vol
TOC	-	0 to 15 mg/m ³		

Project No.: 673/0348
Certificate No: Sira MC030016/09
Initial Certification: 01 October 2003
This Certificate issued: 20 May 2013
Renewal Date: 19 May 2018

R Cooper I Eng MInst MC
Technical Director

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service

12 Acorn Industrial Park, Crayford Road, Crayford
Dartford, Kent, UK DA1 4AL
Tel: +44 (0)1322 520500 Fax: +44 (0)1322 520501



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To authenticate the validity of this certificate please visit www.siracertification.com/mcerts
Registered Office: Rake Lane, Eccleston, Chester, UK CH4 9JN*

Approved Site Application

Any potential user should ensure, in consultation with the manufacturer that the emission monitoring system is suitable for the process on which it will be installed.

For general guidance on stack emission monitoring techniques refer to Environment Agency Technical Guidance Note M2: Monitoring of stack emissions to air. Operators with installations falling under the Large Combustion Plant Directive or Waste Incineration Directive must refer to Technical Guidance Note M20: Quality Assurance of Continuous Emission Monitoring Systems, for guidance on the suitability of CEMS for their installations. M2 and M20 are available on the Agency's website at www.mcerts.net

On the basis of the assessment and the ranges required for compliance with EU Directives this instrument is considered suitable for use on waste incineration and large coal-fired combustion plant applications. This CEM has been proven suitable for its measuring task (parameter and composition of the flue gas) by use of the QAL 1 procedure specified in EN14181, for LCPD and WID applications for the ranges specified. The lowest certified range for each determinand shall not be more than 1.5X the emission limit value (ELV) for WID applications, and not more than 2.5X the ELV for LCPD and other types of application.

The field trial was performed over time intervals between 3 months and more than one year with the ACF-NT installed on a municipal waste incinerator. Both H₂ only and H₂/He mix (40% / 60%) fuel types were used during the field test.

Basis of Certification

This certification is based on the following Test Report(s) and on Sira's assessment and ongoing surveillance of the product and the manufacturing process:

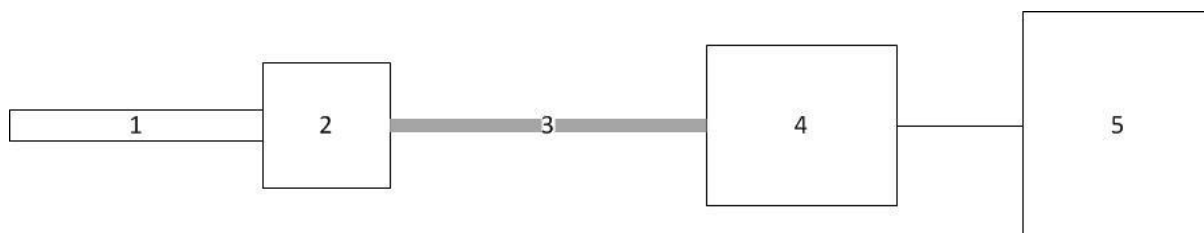
TÜV Rhineland	Report No. 936/801003/A dated 01.10.2001
TÜV Rhineland	Report No. 936/801003/B supplementary report for HF dated 16.10.2001
TÜV Rhineland	Report No. 936/801003/C supplementary report for O ₂ dated 18.01.2002
TÜV Rhineland	Report No. 936/21204160/A dated 21.12.05
TUV Rhineland	Report No. 936/21210471/A dated 13.02.2009

Certificate No: Sira MC030016/09
This Certificate Issued: 20 May 2013

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Product Certified

The measuring system consists of the following parts:



1. Sample Probe	2. Heated Filter	3. Heated Sample Line	4. Gas Conditioning	5. Analyser
Model: PFE2	Model: ceramic filter, pore size <0.3µm	Model: TBL01-S Length: 18m	Model: SC-Block integrated	Model: ACF-NT

Allowable variations could include:

- A different brand or model of sampling system of the same type, provided that there is evidence the alternative system works with similar types of CEM.
- Additional manifolds and heated valves used to allow more than one analyser to share a sampling system.
- FID analyser (optional)
- ZrO₂ analyser (optional)

This certificate applies to all instruments fitted with software version 2.10 onwards (Syscon I system software) and software version 3.0.2 & 3.06 onwards (Syscon II system software)

Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: +5°C to +40°C

Instrument IP rating: IP54

Note: If the instrument is supplied with an enclosure then the ambient temperature shall be monitored inside the enclosure to ensure that it stays within the above ambient temperature range.

Unless otherwise stated the evaluation was carried out on the certification range CO 0 to 75mg/m³, NO 0 to 200 mg/m³, SO₂ 0 to 75mg/m³, HCl 0 to 15 mg/m³, NH₃ 0 to 15 mg/m³, H₂O 0 to 40%vol, O₂ 0 to 25%vol

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time						
CO					136s	<200s
NO					147s	<200s
SO ₂					144s	<200s
HCl					151s	<400s
NH ₃					143s	<400s
H ₂ O					140s	<200s
HF					256s	<400s
O ₂					13s	<200s
TOC					33s	<200s
Repeatability standard deviation at zero point						
CO	0.17					<2.0%
NO		0.56				<2.0%
SO ₂	0.45					<2.0%
HCl		0.53				<2.0%
NH ₃			1.13			<2.0%
H ₂ O	0.13					<2.0%
HF		1.00				<2.0%
O ₂	0.04					<0.2%
TOC	0.07					<2.0%

Certificate No: Sira MC030016/09

This Certificate Issued: 20 May 2013

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Repeatability standard deviation at span point						
CO	0.24					<2.0%
NO	0.46					<2.0%
SO ₂	0.37					<2.0%
HCl		0.93				<2.0%
NH ₃		0.87				<2.0%
H ₂ O	0.23					<2.0%
HF			1.80			<2.0%
O ₂	0.20					<0.2%
TOC		1.00				<2.0%
Lack-of-fit						
CO		0.8				<2.0%
CO 0 to 300 mg/m ³	0.3					<2.0%
NO	-0.4					<2.0%
NO 0 to 400 mg/m ³	0.4					<2.0%
SO ₂		-0.6				<2.0%
SO ₂ 0 to 300 mg/m ³		0.6				<2.0%
HCl		-0.8				<2.0%
HCl 0 to 90 mg/m ³			1.3			<2.0%
NH ₃			1.2			<2.0%
H ₂ O		-0.9				<2.0%
HF			-1.9			<2.0%
HF 0 to 10 mg/m ³			-1.7			<2.0%
O ₂	-0.1					<0.2%
O ₂ 0 to 12%vol	0.14					<0.2%
O ₂ 0 to 6%vol	0.02					<0.2%
TOC	0.1					<2.0%

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of ambient temperature zero point						
CO		0.8				<5.0%
NO		0.8				<5.0%
SO ₂			-2.0			<5.0%
HCl			-1.4			<5.0%
NH ₃				2.1		<5.0%
H ₂ O	0.4					<5.0%
HF				-2.4		<5.0%
O ₂	-0.08					<0.5%
TOC		1.0				<5.0%
Influence of ambient temperature span point						
CO			1.7			<5.0%
NO				2.3		<5.0%
SO ₂			-1.1			<5.0%
HCl				-3.0		<5.0%
NH ₃				3.7		<5.0%
H ₂ O				-2.6		<5.0%
HF				4.0		<5.0%
O ₂	-0.26					<0.5%
TOC			1.3			<5.0%

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of sample gas flow for extractive CEMS					Note 1	
CO, SO ₂ , HCl, NH ₃ , H ₂ O						<2.0%
NO, O ₂	0.00					<2.0%
HF			-1.4			<2.0%
TOC	<1.0					<2.0%
Influence of voltage variations 190 to 250V						<2.0%
CO	0.3					
NO	0.3					<2.0%
SO ₂	0.1					<2.0%
HCl	-0.5					<2.0%
NH ₃	-0.5					<2.0%
H ₂ O	0.5					<2.0%
HF		0.8				<2.0%
O ₂					Note 2	<0.2%
TOC					Note 2	<2.0%
Influence of vibration (10 to 60Hz (±0.3mm), 60 to 150Hz at 19.6m/s ²)					Not tested Note 3	To be reported
Cross-sensitivity at zero					Note 4	
CO			-1.7			<4.0%
NO				2.8		<4.0%
SO ₂				-3.5		<4.0%
HCl			-1.6			<4.0%
NH ₃				-3.6		<4.0%
H ₂ O	<0.5					<4.0%
HF				-4.0		<4.0%
O ₂	<0.02					<0.4%
TOC			1.8			<4.0%

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Cross-sensitivity at span					Note 4	
CO				-3.7		<4.0%
NO				2.2		<4.0%
SO ₂				3.6		<4.0%
HCl				2.6		<4.0%
NH ₃				2.4		<4.0%
H ₂ O	<0.5					<4.0%
HF				-4.0		<4.0%
O ₂	<0.02					<0.40%
TOC				3.4		<4.0%
Effect of oxygen for TOC CEMS	-0.5					<2.0%
Response factors for TOC CEMS						
Methane					1.09	0.9 to 1.2
Aliphatic Hydrocarbons (cyclohexane)					1.02	0.9 to 1.1
Aromatic Hydrocarbons (toluene)					0.96	0.8 to 1.1
Dichloromethane (tetrachlorethene)					0.97	0.75 to 1.15
Aliphatic alcohols (Isopropanol)					0.74	0.7 to 1.0
Ester and keytones (acetone)					0.71	0.7 to 1.0
Organic acids					Not tested	0.5 to 1.0

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Measurement uncertainty						
CO (ELV 50 mg/m ³)					9.8% (Note 5)	7.5%
NO (ELV 130 mg/m ³)					8.2%	15%
SO ₂ (ELV 50 mg/m ³)					10.0%	15%
HCl (ELV 10 mg/m ³)					11.8%	30%
NH ₃ (ELV 10 mg/m ³)					12.5%	15%
H ₂ O (range 40 Vol%)					4.2%	7.5%
HF (ELV 2 mg/m ³)					31.5% (Note 5)	30%
O ₂ (range 25Vol%)					2.4%	7.5%
TOC (ELV 10 mg/m ³)					18.2%	22.5%
Calibration function (field)						
CO					0.99	>0.90
NO					0.99	>0.90
SO ₂					0.99	>0.90
HCl					0.99	>0.90
NH ₃					0.99	>0.90
H ₂ O					0.99	>0.90
HF					0.96	>0.90
O ₂					0.99	>0.90
TOC					0.98	>0.90

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time (field)						
CO					178s	<200s
NO					182s	<200s
SO ₂					198s	<200s
HCl					196s	<400s
NH ₃					192s	<400s
H ₂ O					190s	<200s
HF					187s	<400s
O ₂					<120s	<200s
TOC					<120s	<200s
Lack of fit (field)						
CO	0.3					<2.0%
NO	0.5					<2.0%
SO ₂		-0.7				<2.0%
HCl			1.2			<2.0%
NH ₃		0.9				<2.0%
H ₂ O		-0.6				<2.0%
HF			-2.0			<2.0%
O ₂		-0.7				<0.2%
TOC		0.6				<2.0%

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Maintenance interval						>8 days
CO, NO, SO ₂ , HCl, NH ₃ , H ₂ O					6 months	>8 days
HF					3 months	>8 days
O ₂					1 month	>8 days
TOC					2 weeks	>8 days
Zero and Span drift requirement	<p><u>Statement from Manufacturer:</u></p> <p>ACF-NT A twice daily zero calibration is carried out automatically using purified air. A verification of the span point is required only every six months.</p> <p>RGM11 (Optional) The analyser is checked for zero and span drift on the 1st day of every month using air. Zero-point calibration takes place using air. Span-point calibration takes place using a mixture of oxygen in nitrogen. Automatic calibration is possible via built-in zero gas and test gas valves.</p> <p>MultiFID14 (Optional) The analyser is checked for zero and span drift every 14 days using test gases. Zero-point calibration takes place using air or nitrogen. Span-point calibration takes place using propane or another hydrocarbon in air or nitrogen. Automatic calibration is possible via built-in zero gas and test gas valves.</p>					
Change in zero point over maintenance interval						
CO		-0.9				<3.0%
NO		0.9				<3.0%
SO ₂			1.1			<3.0%
HCl			1.7			<3.0%
NH ₃			1.2			<3.0%
H ₂ O	0.1					<3.0%
HF				3.0		<3.0%
O ₂	0.15					<0.2%
TOC				2.3		<3.0%

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Change in span point over maintenance interval						
CO				-2.7		<3.0%
NO			1.6			<3.0%
SO ₂			-1.9			<3.0%
HCl				-2.7		<3.0%
NH ₃				3.0		<3.0%
H ₂ O			-1.5			<3.0%
HF				2.6		<3.0%
O ₂	0.20					<0.2%
TOC				2.8		<3.0%
Availability						
CO, NO, SO ₂ , HCl, NH ₃ , H ₂ O					98.2%	>95%
HF					97.1%	>95%
O ₂ , TOC					99.4%	>98% for O ₂
Reproducibility						
CO				2.4		<3.3%
NO			1.4			<3.3%
SO ₂				3.2		<3.3%
HCl			1.4			<3.3%
NH ₃			1.5			<3.3%
H ₂ O				2.9		<3.3%
HF				3.2		<3.3%
O ₂	0.06					<0.20%
TOC			1.9			<3.3%

- Note 1 The sample gas flow test has been performed for O₂, HF, NO and TOC. O₂ and TOC have been tested as different sensors are used. NO has been tested as it is a standard measurement, and HF tested as it is deemed the most difficult component of the FT-IR measurement.
- Note 2 For TOC and O₂ no relevant influence on reading due to voltage variations was detected by the test house, but the readings were not recorded.
- Note 3 The measuring system was not tested against vibration as it is an extractive analyser.
- Note 4 Interferents used for cross sensitivity: O₂, H₂O, CO, CO₂, CH₄, N₂O, NO, NO₂, NH₂, NH₃, SO₂, HCl
- Note 5 The measurement uncertainty result for CO and HF does not meet the requirements of EN-15267-3: 'at least 25% below max permissible uncertainty', but does meet the requirements of the EC directives 2000/76/EC (WID) and 2001/80/EC (LCPD).

Description:

The ABB Advance Cemas FTIR-NT (ACF-NT) system is a hot/wet extractive multigas analyser using Fourier Transform Infrared (FTIR) analysis to measure several gaseous components (including water).

The RGM 11 which is a zirconia-sensor based monitoring system for oxygen, and the AO2000-MultiFID14 which is a flame ionisation detector measuring total content of organic carbon, can be optionally integrated.

The loss-free measurement of the lowest concentrations of water-soluble components is achieved by seamless heating of the system to 180°C – from the probe filter element to the analyzer.

A low-maintenance electronically controlled air injector system conveys the sample gas from the chimney stack to the analyzers at constant pressure. In order to avoid pressure dependencies, which could arise if an uncontrolled feed pump were used, no moving parts are employed.

Measurements at very high moisture content are possible using a chemometric model optimized for waste incineration processes.

General Notes

1. This certificate is based upon the equipment tested. The Manufacturer is responsible for ensuring that on-going production complies with the standard(s) and performance criteria defined in this Certificate. The Manufacturer is required to maintain an approved quality management system controlling the manufacture of the certified product. Both the product and the quality management system shall be subject to regular surveillance according to 'Regulations Applicable to the Holders of Sira Certificates'. The design of the product certified is defined in the Sira Design Schedule for certificate No. Sira MC030016/05
2. If certified product is found not to comply, Sira Certification Service should be notified immediately at the address shown on this certificate.
3. The Certification Marks that can be applied to the product or used in publicity material are defined in 'Regulations Applicable to the Holders of Sira Certificates'.
4. This document remains the property of Sira and shall be returned when requested by the company.